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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------------------|-----------------------------|
| 10/594,324 | 01/19/2007 | Oliver Wright | 296852US2PCT | 3332 |
| 22850 | 7590 | 10/10/2007 | | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER DOAN, JENNIFER | |
| | | | ART UNIT 2874 | PAPER NUMBER |
| | | | NOTIFICATION DATE 10/10/2007 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/594,324

Applicant(s)

WRIGHT ET AL.

Examiner

Jennifer Doan

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-54 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>092706</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. All of the prior art documents cited by applicant in the Information Disclosure Statement filed on 09/27/06, have all been considered and made of record (note the attached initialed copy of form PTO-1449).

Drawings

3. The drawings, filed on 01/19/07, are accepted.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claims 1-54 is objected to because of the following informalities:

There is no period "." at the end of claim 1.

In line 1 of claim 1, "Device" should be changed to "A device".

In claim 1, lines 4-5, 12, 14, 20, 21-22 and 24 recite "the said". "the said" should be changed to "said".

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In line 1 of claims 2-54, "Device" should be changed to "The device".

Appropriate correction is required.

Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

Allowable Subject Matter

5. Claims 1-54 are allowed.

The following is an examiner's statement of reasons for allowance:

The prior art of record fails to disclose or reasonably suggest all the limitations recited in claim 1. Specifically, the prior art of record fails to disclose a device for the conversion of optical radiation, comprising a multilayer structure containing one or more layers with a negative dielectric constant and one or more other layers with a positive dielectric constant designed so that the multilayer structure supports at least one surface plasmon-polariton mode, and designed so that at least one of the modes allows the optical parametric interaction of two surface plasmon-polaritons of angular frequencies ω_a and ω_b , resulting in the conversion to a frequency-upshifted surface plasmon-polariton with angular frequency $\omega_a + \delta$ and a surface plasmon-polariton, downshifted by an equal amount, with angular frequency $\omega_b - \delta$, where δ is a particular angular frequency shift or set of angular frequency shifts and one or both of the angular frequencies ω_a and ω_b is an angular frequency or set of angular frequencies present in at least one of the incident beams of input optical radiation; means for electrical coupling into a subset of the surface plasmon-polariton modes at the angular

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frequencies ω_a or ω_b or the angular frequencies $\omega_a + \delta$ or $\omega_b - \delta$ of the multilayer structure; means for coupling the input optical radiation into one or more of the surface plasmon-polariton modes at the angular frequencies ω_a or ω_b or the angular frequencies $\omega_a + \delta$ or $\omega_b - \delta$ of the multilayer structure; means for coupling output optical radiation at angular frequencies $\omega_a + \delta$ or $\omega_b - \delta$ out of the multilayer structure; means for coupling output optical radiation at angular frequency ω_a and ω_b out of the multilayer structure; and means for coupling output optical radiation at angular frequency other than ω_a , ω_b , $\omega_a + \delta$ or $\omega_b - \delta$ out of the multilayer structure in combination with the other limitations of claim 1.

Claims 2-54 depend from claim 1.

Conclusion

6. This application is in condition for allowance except for the following formal matters:

This application is in condition for allowance except for the objection of the title and claims 1-54. Applicant is request to correct the objection of the title and claims.

See MPEP § 608.01(b).

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

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7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sambles (U.S. 6,600,603) discloses a surface capable of supporting surface charge oscillation. And Estes et al. (U.S. 7,177,515) disclose surface plasmon devices.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Doan whose telephone number is (571) 272-2346. The examiner can normally be reached on Monday to Thursday from 6:00am to 3:30pm, second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JENNIFER DOAN
PRIMARY EXAMINER